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THE UNIVERSITY OF ALBERTA

VERBAL CONDITIONING IN A SOCIAL SITUATION

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR

THE DEGREE OF MASTER OF ARTS

DEPARTMENT OF PSYCHOLOGY

BY

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EDMONTON, ALBERTA

AUGUST, 1963.

ABSTRACT

This experiment was designed to evaluate the effects of social pressure on the verbal behavior of subjects in an unstructured situation. The work on verbal conditioning done by Greenspoon and others, and the work in social conformity by Sherif, Asch and Crutchfield has been reviewed.

Subjects were asked to verbalize words at random, and were told that if they gave a word which was within a concept the experimenter was looking for, a light in front of them would indicate that the response was correct. However, the light in front of them was turned on randomly, regardless of their responses.

Decoys were placed with the experimental subjects who were peers of the experimental subjects and acted as if they were subjects. However, they had prepared lists of words which they read in which there were an increasing number of key concept words. In half the experiment one decoy was used and in the other half two decoys were used. There were four experimental conditions: condition (A) with one decoy and Concept One; condition (B) with one decoy and Concept Two; condition (C) with two decoys and Concept One; and condition (D) with two decoys and Concept Two. There were 10 subjects in each experimental condition. Two groups of control subjects of 10 subjects each were used.

It was hypothesized that the subjects placed in a learning situation in which there was no way of learning the required material would follow the lead of the decoys. The experimental subjects would give more concept words than the control subjects because of the presence

of the decoys. This hypothesis was confirmed ($p < .001$). A second hypothesis was that two decoys would exert a greater social pressure than one decoy. This hypothesis was not confirmed in the overall analysis, but was confirmed in the analysis over trials ($p < .025$).

The results showed that there was great variability between the subjects in the amount of conformity. Some subjects followed the decoys from the start, others gave no indication that the decoys had any influence on their thinking. This is in agreement with all the studies done on social conformity so far.

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INTRODUCTION

Statement of the Problem.

Language has been defined as "a system of arbitrary vocal signs that can be used to obtain cooperation and interaction among the members of a social group" (Miller, 1954 p. 693). Psycholinguistics is a science attempting to relate the diverse approaches of many areas of scientific study into a single coherent picture of language. The psycholinguist has three main tasks: first, that of description and analysis of the stream of sound into units and elements; the second task is the measurement of the behavior; the third task is the control of communicative behavior. This thesis belongs in the field of psycholinguistics and in this study the units used were single words, the measurement of the behavior was in terms of number of concept words used, and the control of the behavior was by means of social pressure in an unstructured situation.

The writings of Greenspoon (1962), Sherif (1935) and Asch (1951) led to the formulation of this study as a thesis topic. Their work will be reviewed in detail later, but the statement by Greenspoon (1962, p. 511) that "verbal behavior represents an excellent meeting ground for both the experimental and the applied psychologist" should be quoted at the beginning of the study. Man is the only animal that effectively uses language, and human culture is built on the basis of language. Man uses words as tools to control his own behavior and the behavior of other persons. Further, because verbal behavior occurs in a social setting, it is important to learn the effects others have on the verbal behavior of an individual. Thus, this is a meeting ground of many fields of study in psychology. Salzinger (1959, p. 65) believes that "studies of verbal behavior ... have important implications for

many of the techniques used in clinical, social, and experimental psychology." Skinner (1957, p. 5) says "what happens when a man speaks or responds to a speech is clearly a question about human behavior and hence a question to be answered with the concepts and techniques of psychology as an experimental science of behavior."

The present study was intended to investigate the possibility of modifying verbal behavior by means of social pressure. Verbal conditioning in this study is taken to be the controlling or influencing of an individual's verbal behavior so that the content of what he says is to some extent under the control of the experimenter. Social conformity is taken to be the shaping and molding of an individual's behavior by the behavior of the group in which the individual is placed at a particular time.

In this experiment, subjects were placed in a situation where they were told that their verbalizations were to be conditioned by a certain reinforcement contingency. The subjects did not know that the schedule of reinforcement was such that if they concentrated only on the reinforcements they were instructed to go by, no verbal conditioning would take place because the reinforcements were given randomly. However, decoys in the experimental setting were instructed to verbalize words in a manner similar to the experimental subjects, and the verbalizations of the decoys were designed to simulate the process of conditioning. It was felt that if an individual is given a task where he has to use words, and this task is impossible using the cues that he has been told to use, he will use other cues that are available to him. In this way he will complete the task.

The main hypothesis of the study therefore was that the experimental subjects would find the task impossible if they followed the instructions given by the experimenter, and verbal conditioning would take place by the subjects using the subordinate cues of the decoys' verbalizations. The experimental subjects would thus be yielding to the social pressure of the decoys. A second hypothesis was that increased social pressure would increase the degree of conditioning. In other words, with two decoys the experimental subjects would show more verbal conditioning than with one decoy.

Review of the Literature.

The work done on verbal conditioning, started by Greenspoon (1951), has been reviewed by Krasner (1958), Salzinger (1959) and Greenspoon (1962). Verbal conditioning essentially consists of reinforcing a certain response class in the verbal behavior of an individual by means of a generalized conditioned reinforcer such as "approval". The dependent variable is the response class in the individual's verbal behavior and the independent variable is a generalized reinforcer which is intended to bring the verbal behavior under the control of the person giving the generalized reinforcer.

A response class consists of a number of different responses which are similar to each other in the sense that the occurrence of any one may be substituted for that of any other. A response class of bar pressing in a rat may be slow or fast, hard or soft, but of sufficient force to activate a counter for food magazine. In verbal behavior an even greater diversity in responses exists, and all of these responses

are followed by the same reinforcement or are emitted in the presence of the same discriminative stimulus. The experimenter can reduce the size of the given natural response class by means of differential reinforcement and can in this way shape behavior. In most of the studies done on conditioning of verbal behavior, single words have been used.

The operant level of a response class is a limiting factor. If it is too low, then it becomes impractical to condition such a response class in a reasonable time, and if too high, there is no point in reinforcing and no chance of increase in response class due to reinforcement. In measurement of response, Salzinger suggests that frequency of response is the best method, and it was decided to use that method in the study. The advantages of this method are that the strength of a characteristic can often be most appropriately measured in terms of its frequency of occurrence, and it is possible with this method to use each subject as his own control. This last advantage is used to some extent in the study in measuring the rate of increase of certain responses over trials.

The issue of awareness seems to be a critical issue, and may be in the present study as well. The early experimenters in verbal conditioning reported obtaining learning despite the fact that many subjects were unable to verbalize the relationship between the response class and the contingent stimulus. Some experiments have been specifically designed to establish the relationship between awareness and conditioning, but the results are indecisive, some reporting conditioning without

awareness and others reporting conditioning only when the subject became aware of the reinforcement contingency. The relationship between conditioning and awareness appears to be confused and part of the confusion may be in the definition of awareness. Most experimenters have operationally defined awareness in terms of questions asked the subjects after conditioning, and the number and type of questions would have a profound effect on the number of subjects classified as "aware". It is extremely difficult to devise a set of questions to test awareness and not "give the game away". On the other hand if the questions are too obscure, they are not tapping what they are supposed to tap. It is likely that subjects can become aware of the reinforcement contingency through the questioning and then be classified as aware, or can be aware but the questions be confusing so that the subject does not report his awareness. Also the subjects who report awareness may have become aware after they have obtained a high rate of critical responses, so that the conditioning leads to awareness, not awareness to conditioning. The problem of awareness would be of importance from a theoretical aspect, but for anyone interested in changing verbal behavior, the evidence would indicate that for maximum conditioning the subjects should be aware of the reinforcing contingency.

Verbal conditioning in a group setting has received little attention, mainly because of the difficulties in controlling the increased number of variables present. Bachrach (1961) did a series of experiments in which a subject was in a group with two others whom he believed were naive subjects like himself but who were actually

experimenters attempting to condition the subject. These experiments are an extension of ones involving the subject and one experimenter and are therefore no more relevant to the present study than previously cited experiments. Research efforts that would be relevant to the present study are those oriented towards determining the discriminative stimulus value of individuals in the group setting.

The early work on group influence in social psychology did not use the terms of learning theory and conditioning, but it is possible to interpret the results from a learning theory standpoint. The early experiment on conformity in human subjects in a social setting is the classic study of social psychology done by Sherif (1935). He placed individuals in an experimental situation in which they judged the amount of apparent movement of a pinpoint of light in a dark room - the autokinetic phenomenon. This is an unstructured situation in which the subject was placed in a situation where he could not know which responses were right and had to rely on whatever cues he could pick up from the environment for guidance. Sherif put his subjects in groups in the same situation as they had been in individual sessions and he found that when individuals start with divergent judgements, the judgements tended to converge towards a common norm. Sherif (1958) points out that this convergence exhibits a temporal pattern; the convergence is not brought about instantly by the direct influence of another in the same situation, but is gradual. He adds that the subjects need not be aware of the fact that they are being influenced by others in

the setting, and in fact most of his subjects reported that they were not influenced by others.

Asch (1952, p. 387-388) feels that people in the same field alter each others' ideas, feelings, purposes and actions and that a person cannot be in a social field and be free of its effects. Asch starts with a simple question, "how do we acquire knowledge from the observation of others? Much of what we know or are able to do we have mastered with the help of other persons, either by observing their actions or by following the trend of their thinking."

The most widely known experiments on social influence were conducted by Asch (1952; 1955). In these experiments subjects were placed in a group situation and were required to judge the length of lines. In the group was one "critical" subject and the rest were collaborators of the experimenter. Asch found that there was yielding by the critical subjects in some instances but great variability between subjects. Some yielded more than others and a substantial proportion retained their independence throughout. Asch also points out that variations in structural clarity have a decisive effect on yielding. With diminishing clarity of the stimulus conditions, the amount of yielding increases. Crutchfield (1955) refined Asch's technique for social conformity of individuals and found essentially the same as Asch. Since the early experiments by Sherif, there have been numerous experiments using variations of the basic techniques. Coleman (1958) found that as task difficulty increased, conformity is more easily achieved.

METHOD

Apparatus

The experiment was conducted in a room specially set up for the experiment in the Psychology Department. Tables and chairs were arranged so that the subjects were sitting side by side facing away from the experimenter and upright partitions between the tables separated the subjects from each other, so that although they sat beside each other they were unable to see each other. In front of each subject was a large upright board, blank except for a light in the middle of the board. Only the subject's own light was visible to him.

Each light was connected to a separate switch on a master panel in front of the experimenter. The experimenter could then depress a switch and light any of the lights in front of the subjects. An extra switch on the master panel was not connected and was used as a blind to keep the sound constant throughout the experiment. Therefore every time a subject gave a response a button was pressed.

The only other apparatus required was ruled sheets of paper used by the experimenter to record the responses of the subjects. When reinforcement was to be given, the space for the response to be reinforced was marked by an X in red ink prior to the start of the experiment.

Subjects

The subjects were first year psychology students who were required to participate in three experiments during the year as part of their

course requirements. A book containing time, date, and room number for the experiment was passed around the Psychology 202 classes and each student signed up for a time that he was available. The experiment was called "Verbal Learning, Experiment 10" and this title was written on the cover of the sign-up booklet. Students were asked to sign up only once for this experiment. Only males were used. The reason for only using males was to eliminate one of the experimental variables that would need to be taken into account in dealing with the results of the experiment. There was no necessity for subjects to sign up for this particular experiment as there were other experiments going on at the same time and the experimenter therefore had no control over who signed up. There was therefore no selection of students on the part of the experimenter. Subjects were scheduled singly, one every half hour, and the only information they had concerning the nature of the experiment was from the title of the experiment on the cover of the sign-up booklet.

Decoys

The decoys were peers of the experimental subjects and the decoys had taken part in the pilot study and were willing to work for the experimenter for remuneration. There were six decoys used and they acted as if they were experimental subjects taking part in an experiment. The decoys waited outside the experimental room with the experimental subject until the scheduled time for the experiment. They entered the experimental room with the experimental subjects, listened to the instructions carefully, and occasionally asked a few questions similar to other experimental subjects. The decoys adjusted the rate of giving

words to the experimental subject's rate; if the experimental subject was slow and hesitant, the decoy did likewise, if the experimental subject was quick and crisp in his verbalization, the decoys followed suit. When two decoys were used they attempted to take the cubicles on either side of the experimental subject but if the experimental subject took the first or last cubicle, the decoys just sat where it seemed most natural and convenient.

Instructions to Subjects

The experimental subject and the decoys were met at the door of the experimental room by the experimenter and the subjects were told to sit down at one of the tables. The experimenter sat at another table behind the subjects. The instructions were then read to the subjects.

INSTRUCTIONS

This is an experiment in verbal learning.

Your task will be to verbalize words, giving a word about every 5 seconds. For example, you, A, say a word aloud, any word, then about 5 seconds later you, B, say a word, then C says a word, then A, then B, and so on. The words you use are entirely up to you, and you should make the selection of your words as varied as possible. Do not count, or stick to one series of association for too long, or use one word over and over again.

I will be looking for some class of words that have something in common and if you give a word

which fits the class of words, the light in front of you will come on indicating that you are right. Your task then is to try to say as many words as possible within the concept, and thereby get the most number of lights and as high a score as possible.

Any questions?

The subject closest to the door was then asked to begin, and every word given by the experimental subject was recorded by the experimenter. A button on the master panel was pressed after each word given by either the experimental subject or the decoy. The experimental subject was given a light in a strictly random order from a table of random numbers determined previously and marked in on the recording sheet.

All subjects gave 70 words and the experimenter recorded the words as they were verbalized. If the subjects went too fast for the experimenter to record, they were asked to slow down, but they could take as long as they liked. The length of time required per subject ranged from 15 to 25 minutes.

If a subject looked upset or perplexed at the end of the experiment, or if he asked what the concept was, he was told that he had had a very difficult concept to learn and that he had done well. If he wanted to know what the experiment was about, he was told that he was welcome to come back and find out all about it after the whole experiment was finished. Also subjects were asked not to discuss the experiment with

their friends. As the experiment was done about one month before final examinations, most students did not bother to stay and talk after the experiment but left without any enquiry.

Stimuli

The decoys were given a prepared list of words in which the concept words gradually appeared, giving the impression of gradual learning. (See Appendices A, B, C, & D). The concepts chosen were "vehicles" and "fruit and vegetables". A number of different concepts was tried out in a pilot study and the two that were chosen seemed to be the most suitable for this study. The operant level of giving these words was low enough to make a learning curve possible and meaningful if these concepts were reinforced, yet the concepts were not that unfamiliar to the subjects that words within those concepts were never given. They also appeared to be equivalent in frequency of response and in difficulty.

The lists given the decoys were words chosen from verbalization of subjects in the pilot study. Words within the concept ("vehicles" or "fruit and vegetables") were introduced after about 15 non-concept words and the number of concept words was increased gradually to make it appear as if the decoys were genuinely learning the concept. There were no concept words in the first block of 10 words, two concept words in the second block, six in the third block, eight in the fourth block and then 10 concept words in blocks five, six and seven.

Experimental Design

There were four experimental conditions and ten subjects in each condition. Condition A was with one decoy giving words dealing with the concept "vehicles". Condition B was one decoy with the concept "fruit and vegetables", Condition C was with two decoys with concept "vehicles" and Condition D was two decoys with concept "fruit and vegetables". This made 40 subjects in the experimental groups. The first 20 subjects who signed up were given the vehicle concept and the second 20 the other concept. The distribution of subjects to experimental condition could have been determined on a random basis, but because of the difficulty of scheduling decoys and because of the possibility of subjects telling their friends of the concepts used, it was decided to finish one concept first then change the concept for the next 20 subjects.

Two groups of control subjects were used. Ten were scheduled in pairs to correspond with the A and B experimental condition with one experimental subject and decoy, and twelve were scheduled in threes to correspond with the C and D experimental condition of one experimental subject and two decoys. The control subjects were given the same instructions as in the experimental condition, but there were no decoys, and all subjects were randomly reinforced. All the responses were taken down verbatim by the experimenter.

The control group with three to a group had 12 subjects whereas all the other groups had 10 subjects per group. It was therefore decided to ignore the results of two of the group to make all groups the same number. The two subjects to be ignored were chosen at random.

The control groups acted as controls for both concept words. The subjects were reinforced on a random basis regardless of the words given, and their responses were scored for both concept words.

The experimental conditions were completed in eight days and the control conditions were done two days after that. Speed was important in collecting the data to minimize the chances that the subjects would discuss the experiment with their friends. One experimental subject at the end of the experiment indicated that he had become aware of the purpose of the experiment but he stated that he only became aware of the purpose of the experiment after it was over and he had a chance to think it over. The results of one experimental subject were not included as he did not appear to be trying to learn any concept, and after the experiment told the decoy he had purposely ignored the instructions in order to mess up the experiment.

Scoring.

The responses were divided into seven blocks of 10 words and each block was called one trial. There were therefore seven trials per subject and the number of concept words within each trial was plotted as the subject's learning curve. An operational definition of the concepts was as follows:

CONCEPTS

Vehicle: any man-made contraption that can be used for transportation on land, water, air, ice or snow. Does not include parts of such vehicles (e.g. tires, steering wheel) but must be the whole.

Fruit & vegetable: any plant, fruit, root or seed used by man as food. Does not include parts of plants not edible, (e.g. trees, roots unspecified, leaves unspecified).

In the scoring it should be pointed out that the words scored as concept words did not include parts of the vehicles such as steering wheels, tires etc. and in the vegetables and fruits such words as leaves, trees, etc. Subjects gave a number of these words which would indicate some influence of the decoy, but this influence is not reflected in the scores.

As a check on the accuracy of the scoring done by the experimenter, an independent judge who knew nothing about the experiment was asked to score each subject on both concept words. The totals obtained by the experimenter and the independent judge were then compared.

RESULTS

A comparison of the scoring by the experimenter and by the independent judge of the number of concept words given by the subjects showed little discrepancy. The totals given by the experimenter were 495 concept words in the experimental groups and 53 concept words in the control groups. The totals for the independent judge were 487 concept words for the experimental groups and 46 concept words for the control groups. The Pearson product-moment correlation coefficient between experimenter's and independent judge's scoring was .995.

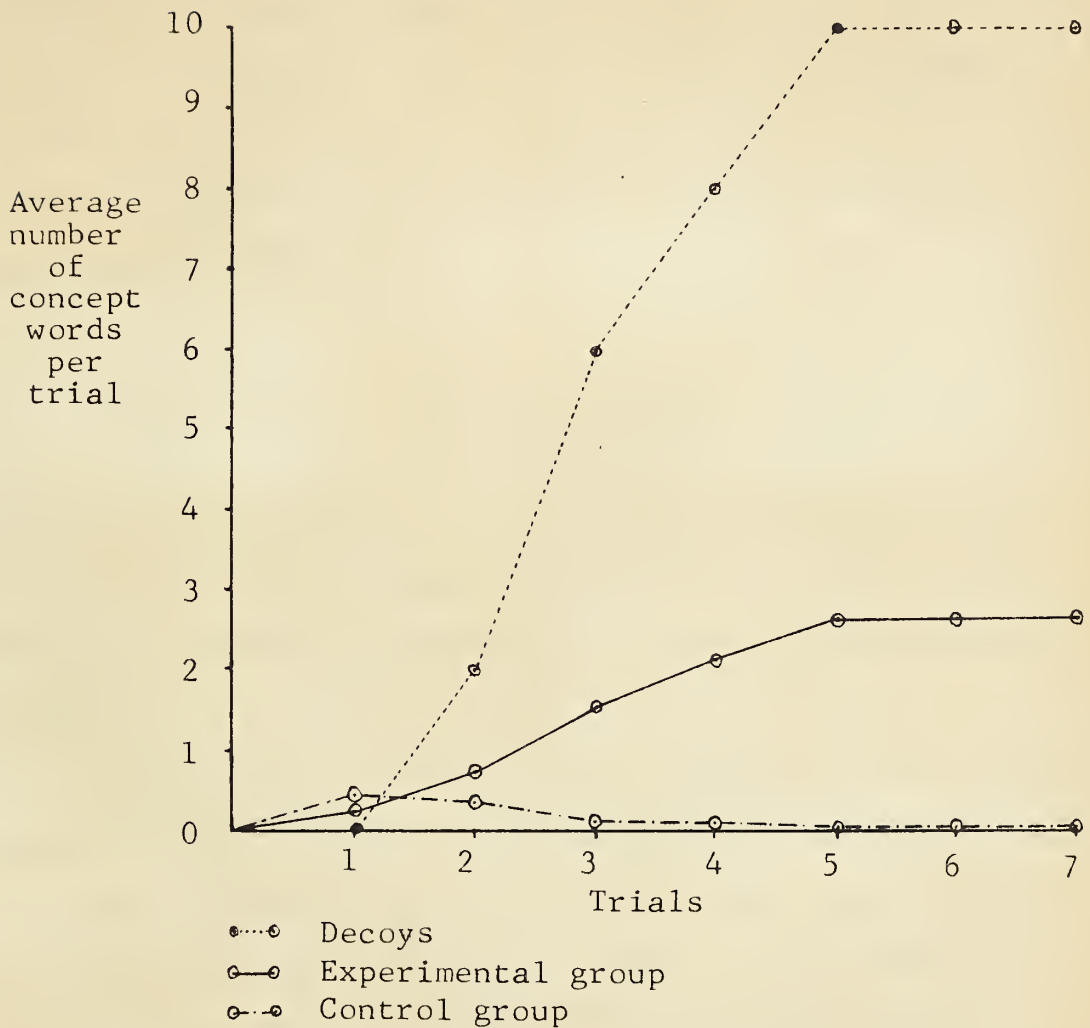
The experimental group had been given two concepts, "vehicles" and "fruit and vegetables". The difference between the two experimental groups divided into concepts was tested by using a t ratio and it was found that there was almost no difference between the two groups. ($t = .925, d.f. = 18, p = N.S.$). It was therefore decided to combine the experimental groups by concepts, which left the two experimental groups divided into those with one decoy and those with two decoys with an N of 20 in each group.

The control subjects had been scored for both concept words so it was decided to average the number of concept words for each subject. For example if one subject gave two "vehicle" responses and four "vegetable and fruit" responses, his score would be three concept words.

A comparison of the average number of concept words given by the experimental subjects, control subjects, and decoys is shown graphically in Figure 1.

Figure 1

Comparison of Decoys, Experimental Subjects
and Control Subjects on Number of Concept Words



It can be seen that the curve for the experimental subjects tends to follow the curve for the decoys, but at a lower rate of responding. The control subjects gave fewer concept words than the experimental subjects, in fact the average response rate of the control subjects was almost zero over most trials.

The matrix for the analysis of variance was a 2 x 2 design, control and experimental groups divided into two group sizes two and three. With unequal Ns in the blocks, a correction suggested by Ferguson (1959) was applied to the sums and sums of squares. Table 1 shows the summary of the analysis of variance of the experimental and control groups.

INSERT TABLE 1 HERE

Group size did not prove to be a significant variable ($F = .45$, $p = \text{N.S.}$); the interaction was not significant ($F = 1.44$, $p = \text{N.S.}$); but the difference between the experimental and control groups was highly significant ($F = 28.86$, $p < .001$).

A trend analysis using the method described by Edwards (1960) gives the rate of learning between the different experimental groups. The results were treated in a 4 x 7 matrix, four experimental groups, ten subjects in each group and seven trials with ten words in each trial. The results of this analysis are summarized in Table 2.

INSERT TABLE 2 HERE

Table 1

Summary of Analysis of Variance of Experimental
and Control Groups.

Source of Variance	Sum of Squares	Degrees of Freedom	Variance Estimate	F
Number of decoys	28.36	1	28.36	.45
Experimental Condition	1,839.84	1	1,839.84	28.86 *
Interaction	91.88	1	91.88	1.44
Within cells	3,568.85	56	63.73	
Total	5,528.93	59		

* - $p < .001$

Table 2

Summary of Trend Analysis of Experimental Groups

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square	F
A Group size	21.17	1	21.17	1.15
B Concepts	.09	1	.09	.00
A x B group size x concepts	11.61	1	11.61	.63
Error (a)	662.75	36	18.41	
C trials	228.19	6	38.03	12.27**
A x C group size x trials	49.40	6	8.23	2.66**
B x C concepts x trials	36.08	6	6.01	1.94
A x B x C	11.27	6	1.88	.61
Error (b)	669.35	216	3.099	
Total	1,689.09	279		
Linear component	204	1	204	65.83**
Quadratic component	20.12	1	20.12	6.45*

* - p < .025

** - p < .01

As can be seen from the table, there is no significant difference between group size or concepts. There is a highly significant difference between trials taken over all the groups, showing that learning took place progressively over the trials. There is no significant difference between concepts, indicating that the learning curves for the two concepts did not differ, while the group x size trials was significant ($F = 2.66$, $p < .025$) indicating there was a difference in learning rate between the two experimental groups with regard to group size. Diagrams of these curves show graphically the differences.

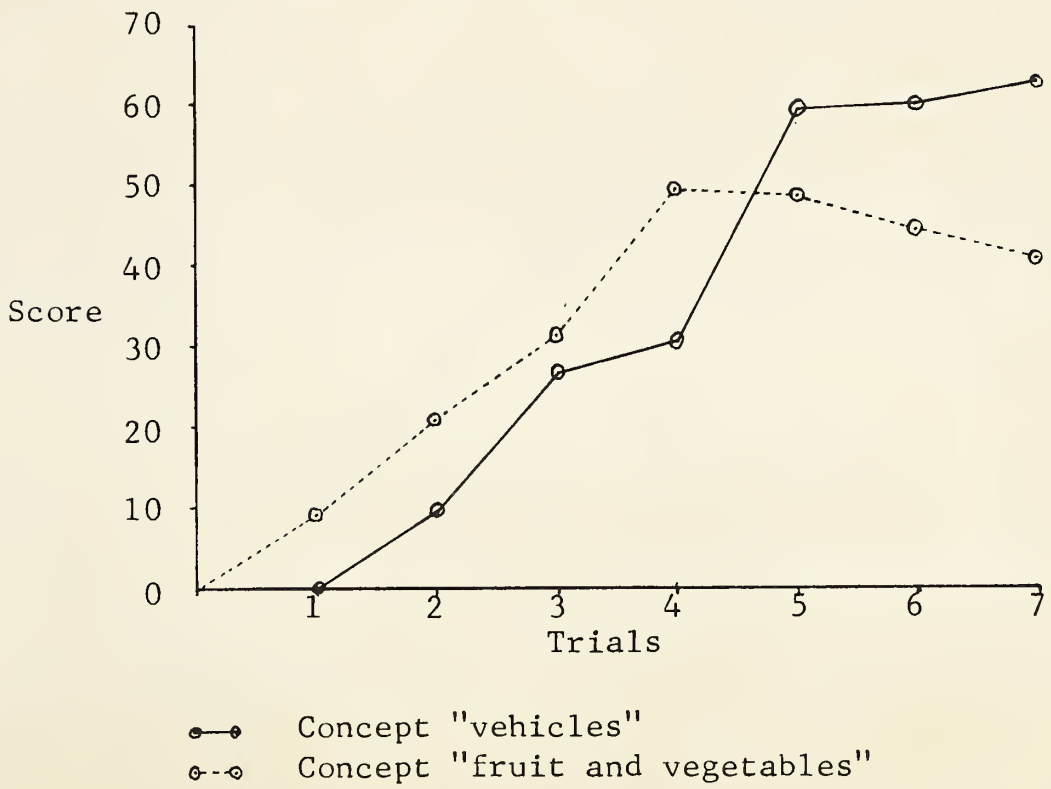
INSERT FIGURES 2 & 3 HERE

The linear trend over all the groups was highly significant and positive ($F = 65.83$, $p < .001$). The quadratic trend over all groups was also significant ($F = 6.49$, $p < .025$). This shows that the learning which took place was not a straight line but was negatively accelerated. Figures 2 and 3 show graphically the curves and help clarify the statistical findings.

The statistical comparison of the data so far has indicated the main results of the study, but there are further interesting indications in the data which are obscured by taking the means for the data. It was found that some of the experimental subjects were "learners" and some were "non-learners", and a means of the score for both learners and non-learners only gives part of the picture. A learner was arbitrarily defined as a subject who gave 50% or more concept words over the last

Figure 2

Comparison of Experimental Group Scores by Concepts



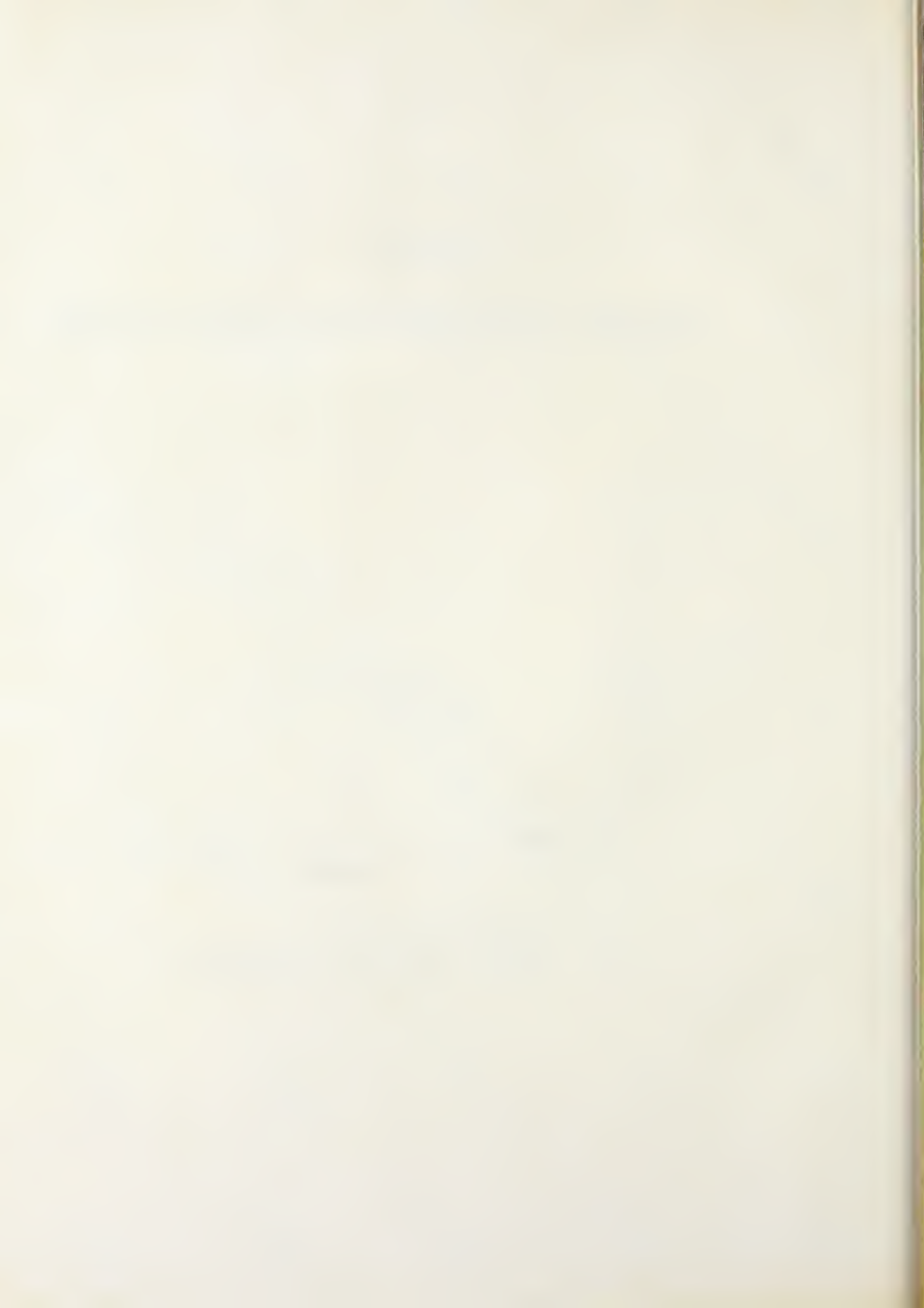
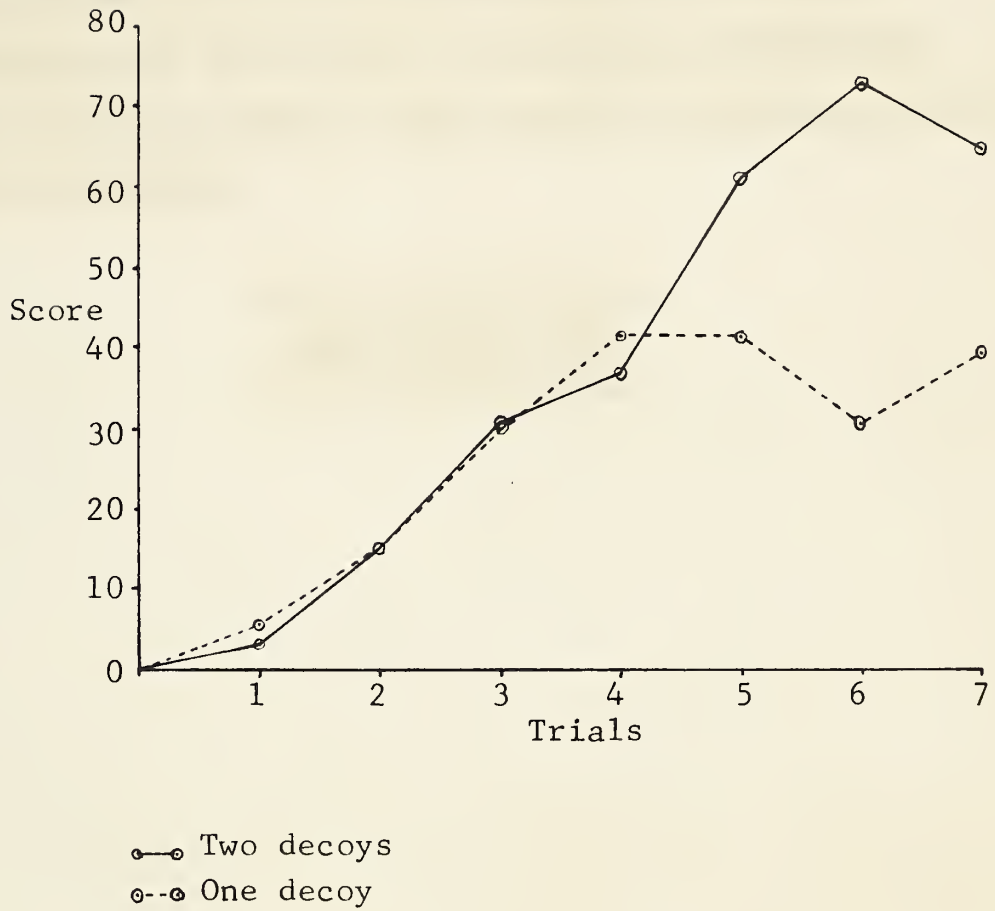


Figure 3
Comparison of Experimental Group
Scores by Group Size



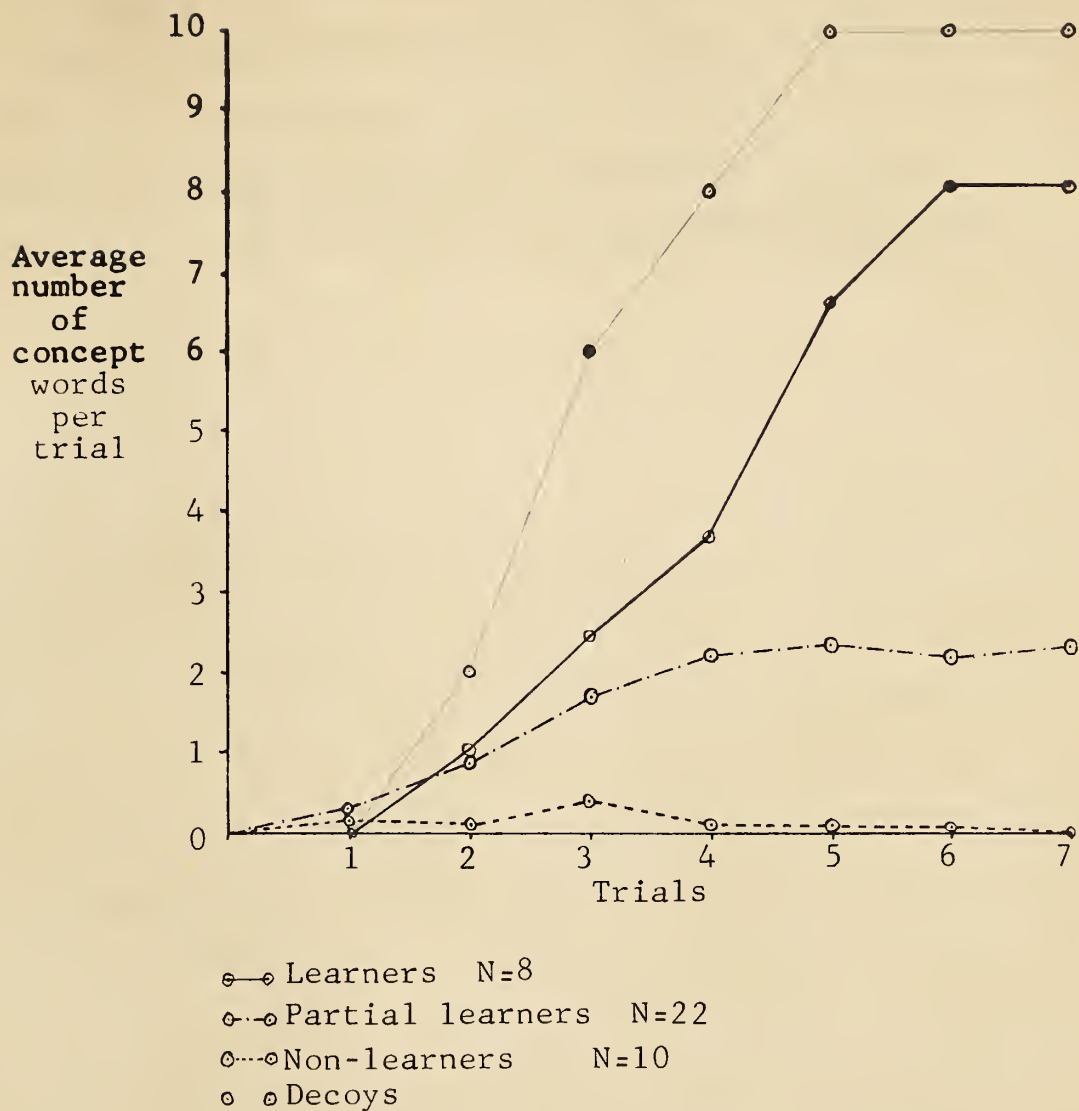
three trials, and a non-learner was defined as someone who gave less than 5% concept words over the last three trials. The remainder of the subjects learned somewhat. On the basis of this division a comparison was made of the 40 experimental subjects: eight were learners, 10 were non-learners, and 22 learned somewhat. Thus almost $1/4$ followed the decoys in verbalizations, $1/4$ were not influenced by the decoys' verbalizations, and just over $1/2$ of the subjects were influenced to some extent by the decoys. Figure 4 shows the curves of the subjects divided in this manner.

INSERT FIGURE 4 HERE



Figure 4

Comparison of Learners and Non-Learners on
Number of Concept Words Given



DISCUSSION

Table 2 and Figure 1 show that the main hypothesis of the study was supported. The experimental groups gave significantly more concept words than the control groups and this learning was progressive over trials. This is consistent with the statement quoted earlier that people in the same field alter each others' ideas. The progressive learning is also consistent with the learning curves found in other types of learning experiments, and with Sherif's (1958) findings that the conformity is gradual.

The second hypothesis, that an increase in the amount of social pressure will give an increase of conformity was not found in the overall analysis of the results. However, as shown in Figure 3, there is a difference between the experimental groups according to the number of decoys in the later stages of learning. This effect is masked in the early trials when social pressure of the decoys is limited, but on later trials the increased social pressure of two decoys over one decoy shows up. The significant interaction of trials x group size indicates that the difference between one and two decoys is significant (Table 2). This is in agreement with Asch's (1952) findings.

The question now arises as to how to explain the results that were found. The subjects were given to believe that they would receive a generalized reinforcer in the form of a light for "correct" words. But because of the design of the experiment, it was impossible for the subjects to learn the concepts according to the instruction given them by the experimenter. They were placed in a situation which was

essentially meaningless, and they were required to impose meaning on the situation. This some of them did as the results showed, and the only cues they could have used were the verbal responses of their peers (decoys) in the experimental situation. In terms of the Skinnerian paradigm of operant conditioning, it is difficult to say what the reinforcement was. The discriminative stimulus was supposedly the light in front of them, but for those who showed a rise in operant level, the discriminative stimulus was not the light but verbalizations of the decoys. This is easier to explain if the subjects are broken down into learners, non-learners, and those who learn somewhat (Figure 4). All subjects received a light for a word before the decoy had given a concept word, and after the first reinforcement, the subject tried a number of words within the area of the reinforced word. This is normal problem-solving behavior, but because of the random pattern of the reinforcements, the subject extinguished on the concept he was trying, and tried another. Some of the non-learners tried a concept long enough and with enough diversity of words that they were being intermittently reinforced for the concept suggested by the word first reinforced, and they remained with that concept throughout the 70 words. By the end of the 70 words, they were either still trying to delimit the concept suggested by the first word reinforced, or they were satisfied to receive only intermittent reinforcement. This behavior is in accordance with Skinnerian principles of conditioning. Those subjects who did not receive reinforcement often enough after their first reinforced word, extinguished on their original concept and showed

some confusion. Some indicated that they may have heard the instructions incorrectly and interrupted the proceedings to ask questions. The instructions were repeated to them. Others tried their originally reinforced word again and most times this was not reinforced on the repetition. This confused them, but the instructions contained the order not to repeat themselves or use the same word over and over again, so it was feasible not to reinforce a word which was repeated. In the confused state the learners and those who learned partly seemed to be seeking cues and this seemed to be the time when most of them tried following the verbalizations of the decoys. In the case of those who learned somewhat, the curve (Figure 4) would lead one to believe that they tried the concept, and then the reinforcement of the lights was insufficient and they started to extinguish. The curve dips down on Trials 6 and 7.

From the curve of the learners it may be hypothesized that in the periods of confusion, cues from the decoys were picked up and reinforcement of the lights was sufficient to maintain them at a high rate of responding with concept words. This would be an explanation in terms of the Skinnerian learning paradigm.

An examination of the actual verbalizations of the subjects in conjunction with the words given by the decoys sheds some light on the thought processes involved. Some of the subjects appear to have followed the Skinnerian principles, but some of the subjects were followers from the start. In the unstructured situation of being asked to verbalize words at random, they were influenced from the beginning by the words

given by the decoys. It is possible that some subjects ignored the lights completely and followed the decoys to prevent the appearance to their peers that they were unable to learn the concept. Crutchfield observed some of the subjects in his experiments avoiding the stimulus of the slides and watching the signal lights, and it is possible in this present study that some of the subjects avoided the lights and pretended to be learning the same concept as their peers appeared to learn. It is impossible to know, with the experimenter sitting behind the subjects, if this occurred but it may be one explanation. Among the non-learners were some who gave no indication of being aware of the words given by the decoys, in fact one non-learner stated afterwards that he felt he could have got the concept if he had been given more time and had not had his concentration interrupted by the others around him.

CONCLUSIONS

In any learning situation, there are a number of factors which influence the acquisition of material to be learned, and in a social setting these factors are not always the ones that the subject concentrates on or is aware of. An individual is always a member of some group and this study has demonstrated that he picks up cues as to appropriate behavior from the other members of the group. This is especially true if the situation in which he finds himself is novel or ambiguous.

There is great variability in the degree to which individuals in a group conform to the group, or pick up cues from the group. This is also shown in the results, some subjects showing almost no influence of the group and some showing that their behavior is to a large extent a function of the behavior of those around them.

This study has supported the findings of many studies in social psychology and studies in the area of verbal conditioning. This is a link between two separate areas of study. When subjects are placed in a situation which is difficult or the meaning is obscure, there is a searching for cues to make the situation meaningful. Much of what we are able to do we have mastered with the help of other persons. The subjects in this study were able to master the task given them by following subordinate cues in the environment. The verbal behavior of the decoys influenced the verbal behavior of the experimental subjects. This study has shown that people can have their verbal behavior channelled along certain lines, and in this way carry out a task even in a most

CHAPTER

The first part of the book is devoted to a general discussion of the principles of the theory of the structure of the human mind. It is in this part that the author lays down the foundations of his theory, and shows how the various parts of the mind are connected together. The second part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together. The third part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together. The fourth part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together. The fifth part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together. The sixth part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together. The seventh part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together. The eighth part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together. The ninth part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together. The tenth part of the book is devoted to a detailed description of the various parts of the mind, and shows how they are connected together.

difficult situation. It is possible that, with or without being aware of the processes involved, people are guided in their behavior by many cues in the environment which are not the ones they are concentrating on. In seeking behavior appropriate to the situation, people are constantly seeking guidance from the environment and following hypotheses suggested by the information the environment provides. In this study, the environment that the subjects were told to concentrate on gave confusing and erroneous information, yet most of the subjects showed by their behavior that they were able to perform the task set them. They were making use of the social environment to provide information.

For the clinical psychologist these results might find applicability in group therapy settings. Group therapy is an unstructured situation similar in some respects to the situation in this experiment, and it is reasonable to say that the learning that takes place in a group is a function of not only the individual himself, but of the verbalizations of the peers in the group. This study has shown that an individual can learn a concept from his peers even if he is not given encouragement or reinforcement in the ways he has been led to expect. This study has shown that verbal behavior can be modified and given direction by the members of a group. It may be possible to change a patient's thoughts and attitudes through the modification of his verbal behavior.

SUGGESTIONS FOR FURTHER RESEARCH

There are a number of possibilities for further study suggested by this experiment. A large number of variables in the study could be systematically manipulated. Only male subjects were used, and it would be interesting to know if there are sex differences in degree of conformity. There might also be differences found by conducting this experiment with the decoys and experimenter of different prestige values, and increasing the number of decoys above that used in the study. There would probably be differences found if psychiatric patients were used as subjects. The degree of conformity could be linked with psychiatric diagnoses or with various personality variables. It would also be of theoretical and practical value to know if the subjects were aware of the conditioning shown by the results.

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APPENDIX A

DECOY LIST 1 VEHICLES

HOUSE
INHIBIT
COW
DESIRE
TRUST
BREW
CURLING
SPEND
PERSPIRATION
GOLD

TREES
MOUNTAIN
SIMILE
COMPRESS
AUTOMOBILE
MOVE
STREAM
TRUCK
MANUFACTURE
MOBILE

ASSEMBLY
COLOR
SCRATCH
TRACTOR
FARM
AEROPLANE
SUBWAY
BICYCLE
ENGINE
BOAT

MASS PRODUCE
JET
MOTOR
BOXCAR
AUTOMATION
WAGON
SCOOTER
TOBOGGAN
AIRLINER
CABOOSE

HELICOPTER
MOTORCYCLE
TRAILER
TRAVEL
ELEVATOR
CAR
BUGGY
SIDECAR
GOCART
TROLLEY

SAILBOAT
SPEEDBOAT
CRUISER
AUTOGYRO
CARAVAN
CHEV
PADDLEBOAT
JEEP
FORD
ESCALATOR

DOGSLED
RAFT
SUBMARINE
MG
COUPE
CARRIAGE
AIRPLANE
ROLLERSKATE
GREYHOUND
VAN

APPENDIX B

DECOY LIST 2 VEHICLES

MAN	SHIP
FATHER	ROWBOAT
EXPERIMENT	HYDROPLANE
ROCK	WATER
MONEY	FISHING BOAT
FURNITURE	SEDAN
CLUB	CONVERTIBLE
MORE	CART
MOVIE	TRUCK
MAGNETIC	TAXI
DOOR	CABLE CAR
BIRDS	VOLKSWAGON
ASSIST	SLEIGH
EXAMPLE	STREETCAR
CAR	BUS
BUOLD	PT BOAT
FENCE	AUTOMOBILE
GATE	AEROPLANE
TRAIN	BATTLESHIP
TRACKS	PADDLEBOAT
VEHICLE	TRACTOR
FIGURE	TROLLEYBUS
MACHINE	BOAT
SHADE	JET
BUS	BOXCAR
TRANSPORTATION	TOBOGGAN
ROAD	AIRLINER
PLANE	MOTORCYCLE
MOTORSCOOTER	ESCALATOR
TRAWLER	SCOOTER
CATERPILLAR	
FACTORY	
PLANE	
STEAMER	
ROCKET	
ROOLS	
SNOWMOBILE	
WEASEL	
STEAMER	
SKIMOBILE	

APPENDIX C

DECOY LIST 1 VEGETABLES & FRUIT

HELPFUL
SHIP
WATCH
GIRL
THOUGHT
STUDY
EXPENSIVE
TEST
HAND
BUS

WORK
ALARM
PISTOL
APPLE
RED
ROUND
PLAY
TOMATO
CHEW
SUN

SOFT
POTATO
CARROT
PEAS
GARDEN
RAIN
BEANS
ORANGES
JUICY
GRAPEFRUIT

RIPEN
VEGETABLES
OATS
CRANBERRY
FALL
WHEAT
BANANAS
CUCUMBER
RADISH
MELON

CHESTNUTS
COCONUT
RASPBERRY
GOOSEBERRY
APPLES
GREEN
DATES
GROUNDNUT
SWEETMELON
BEETS

PEANUTS
LEMON
RICE
BROCCOLI
WAX BEANS
STRING BEANS
HEADLETTUCE
BOYSENBERRY
BLACKBERRY
SASKATOONS

STRAWBERRY
WATERMELON
CANTALOUPE
TURNIPS
EGGPLANT
CELERY
RAISINS
PRUNES
FIGS
PARSNIP

Wiederholungsfragen

Wiederholungsfragen

APPENDIX D

DECOY LIST 2 VEGETABLES & FRUIT

PENCIL
PAPER
BRIDGE
ACTOR
RUN
SIGHT
BELT
WINDOW
WIRE
BARN

WRIST
INCOME
WOMEN
ART
PEAR
EAT
RIPE
CORN
TABLE
FARM

GROW
FRUIT
BANANA
GRAPE
PICK
GROUND
WHEAT
BARLEY
PINEAPPLE
STONE

CHERRY
BLACKBERRY
WALNUTS
SPRING
PEAS
MUSHROOM
LIMES
ASPARAGUS
ONION
LEAVES

LEEK
ARTICHOKE
CABBAGE
SPINACH
BRUSSEL SPROUTS
AVOCADO
BLUEBERRY
BREADFRUIT
PECAN
FIGS

SUGAR CANE
PLUMS
PEACHES
TANGERINE
MANDARIN
GREEN ONIONS
BEENSPROUTS
LETTUCE
LOGANBERRIES
CRABAPPLES

SWEET POTATO
RHUBARB
SWEETMELON
ALMONDS
HAZELNUTS
SWEETCORN
MINT
RED PEPPERS
GARLIC
WATERCRESS

1850

1851

